

REMARKS

Claims 1-7 and 9-21 are now present in this application.

Claim 1 has been amended. Claim 8 has been previously cancelled without prejudice or disclaimer. Reconsideration of the application, as amended, is respectfully requested.

Claim 1 has been amended without adding new matter because "the bubble size is kept almost constant" has been disclosed on page 6, lines 13-15 of this application.

Claim Rejection under 35 USC 103

Claims 1-7, 13, 20 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dao, U.S. Patent No. 5,581,034 in view of Lin, "Liquid-Vapor Phase Transition and Bubble Formation in Micro Structures". Claims 1-7, 9, 11 and 13-21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Leung, U.S. Patent No. 6,182,509 in view of Lin. Claims 10 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dao or Leung, in view of Gaitan, U.S. Patent No. 6,171,880. These rejections are respectfully traversed.

Lin discloses the bubble formation and bubble movement in the micro-channels, such as:

1. "blood cell movement", "oil drop movement" described on page 52, 1 Introduction, lines 3-4;
2. "The bubble is still growing but with a very slow speed ..." described on page 57, col. 2, lines 15-17;
3. "A circular shape bubble about 30 um in diameter is ejected ..." described on page 57, col. 2, lines 18-21; and
4. "the growing of the micro bubble ..." described on page 59, col. 1, lines 38-39.

Thus, Lin does not teach "a size of the bubble is kept substantially constant as the

temperature difference is being sensed" as recited in claim 1. In addition, neither Dao nor Leung teaches "a size of the bubble is kept substantially constant as the temperature difference is being sensed" as recited in claim 1.

In fact, Lin never teaches how to sense the temperature difference according to the micro-bubble. Instead, Lin only teaches that a micro-bubble may be formed in a micro-channel. This teaching has been widely used in an ink-jet printer, in which the micro-bubble is formed and ejected, which has been discussed on page 6, lines 13-15 of this application:

"The bubble is formed in a manner similar to the driving principle of a thermal bubble type ink-jet printer but different from that the bubble size is kept almost constant rather than bubble explosion in the ink-jet application."

The ink-jet printer is not used to sense the temperature difference although it has a bubble formed in a micro-channel. Therefore, Lin's teaching is not used to sense the temperature difference although it has a bubble formed in a micro-channel.

Nevertheless, Lin, Dao, and Leung fail to teach that the size of the bubble is kept substantially constant as the temperature difference is being sensed. Consideration of the amended claim 1 is respectfully requested.

Accordingly, independent claim 1 should now be in condition for allowance. Also, claims 2-7 and 9-21, which depend on the amended claim 1, should now be in condition for allowance.

In view of the foregoing amendments and remarks, it is respectfully submitted that all pending claims should now be in condition for allowance. Reconsideration and withdrawal of the 35 USC 103 rejections are respectfully requested.

CONCLUSION

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

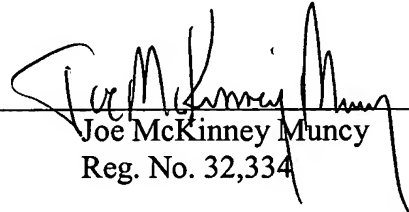
In the event there are any matters remaining in this application, the Examiner is invited to contact Joe McKinney Muncy, Registration No. 32,334 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By


Joe McKinney Muncy
Reg. No. 32,334

KM/GH/mmi
3722-0170P



P. O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000